

## **CHAPTER 2**

### **DESCRIPTION OF THE OLD HICKORY LAKE WATERSHED**

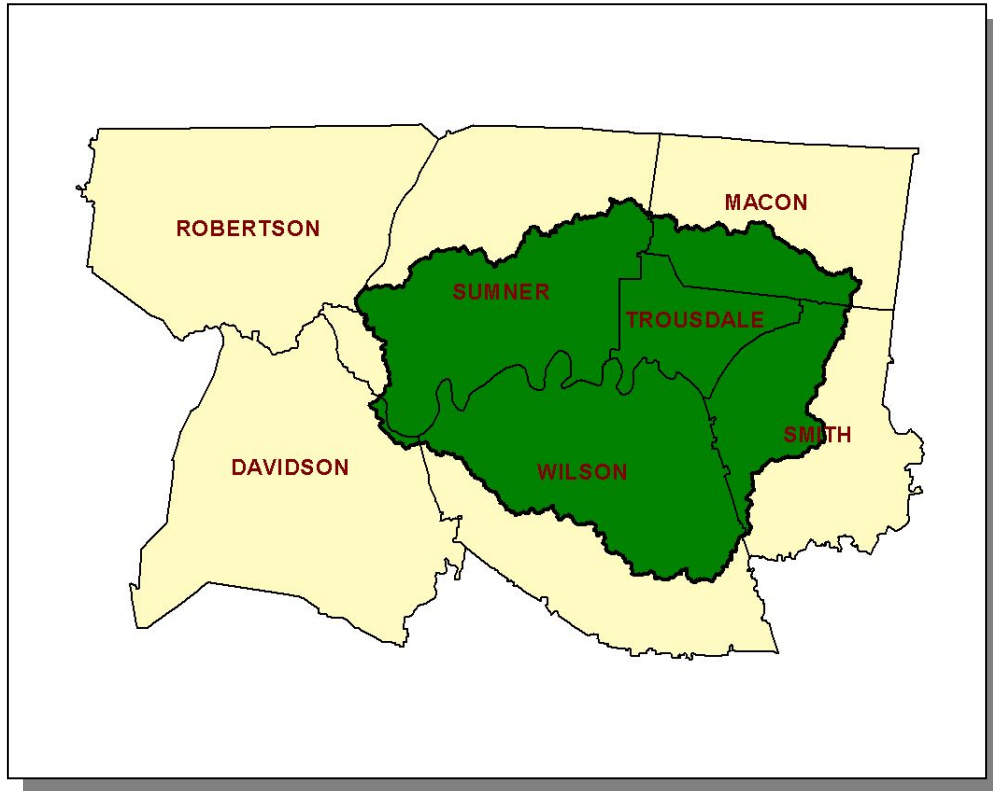
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**2.1. BACKGROUND.** Old Hickory Dam, Lake, and Watershed are named after President Andrew Jackson (nicknamed "Old Hickory"). The lock, dam (completed in 1954), powerhouse and lake are operated and supervised by the U.S. Army Corps of Engineers' personnel under the direction of the District Engineer at Nashville.

This Chapter describes the location and characteristics of the Old Hickory Lake Watershed.

## **2.2. DESCRIPTION OF THE WATERSHED.**

**2.2.A. General Location.** The Old Hickory Lake Watershed is located in Middle Tennessee and includes parts of Davidson, Macon, Robertson, Smith, Sumner, Trousdale, and Wilson Counties.

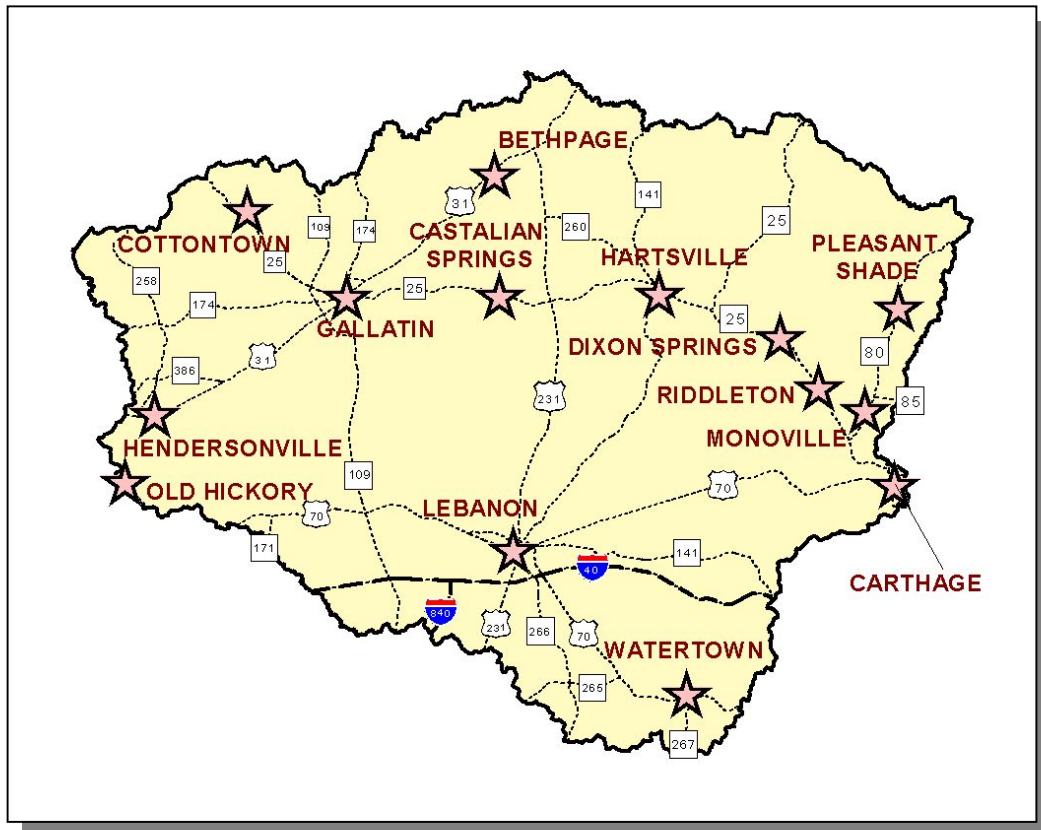


*Figure 2-1. General Location of the Old Hickory Lake Watershed.*

COUNTY	% OF WATERSHED IN EACH COUNTY
Wilson	36.2
Sumner	29.6
Smith	13.4
Trousdale	11.8
Macon	8.5
Davidson	0.5

*Table 2-1. The Old Hickory Lake Watershed Includes Parts of Six Middle Tennessee Counties. 0.01 square miles in Robertson County are also in the watershed.*

**2.2.B. Population Density Centers.** Twenty-six highways serve the major communities in the Old Hickory Lake Watershed.



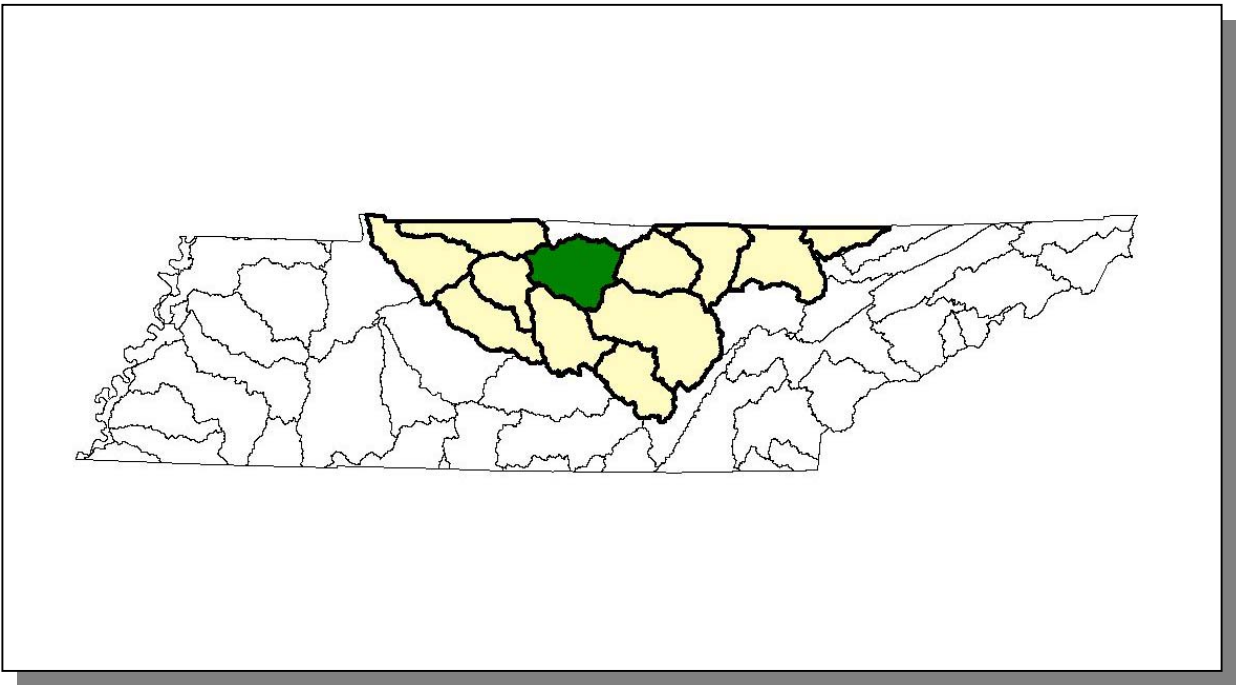
**Figure 2-2. Communities and Roads in the Old Hickory Lake Watershed.**

MUNICIPALITY	POPULATION	COUNTY
Hendersonville	40,849	Sumner
Gallatin*	23,230	Sumner
Lebanon*	20,284	Wilson
Hartsville*	2,395	Trousdale
Carthage*	2,251	Smith
Watertown	1,358	Wilson

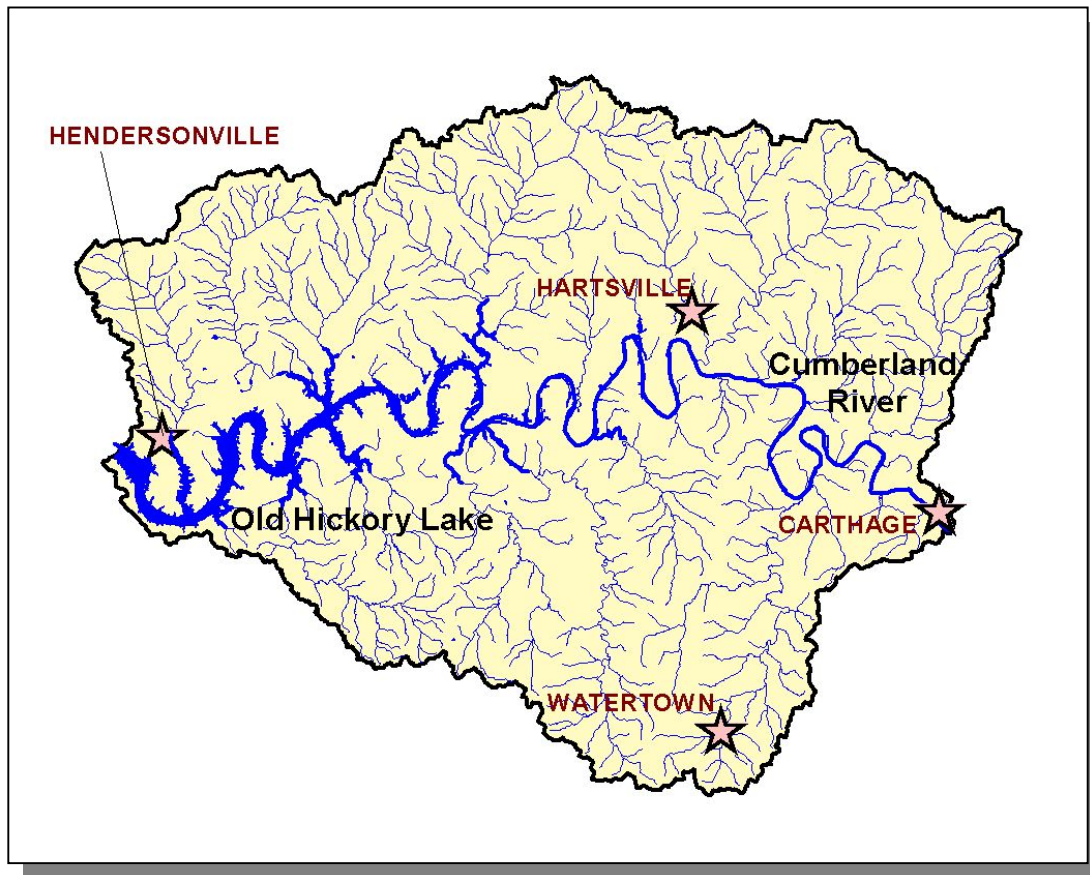
**Table 2-2. Municipalities in the Old Hickory Lake Watershed.** Population based on 2000 census (Tennessee Blue Book) or <http://www.hometownlocator.com>. Asterisk (\*) indicates county seat.

## **2.3. GENERAL HYDROLOGIC DESCRIPTION.**

**2.3.A. Hydrology.** The Collins River Watershed, designated 05130201 by the USGS, is approximately 983 square miles and drains to the Cumberland River.



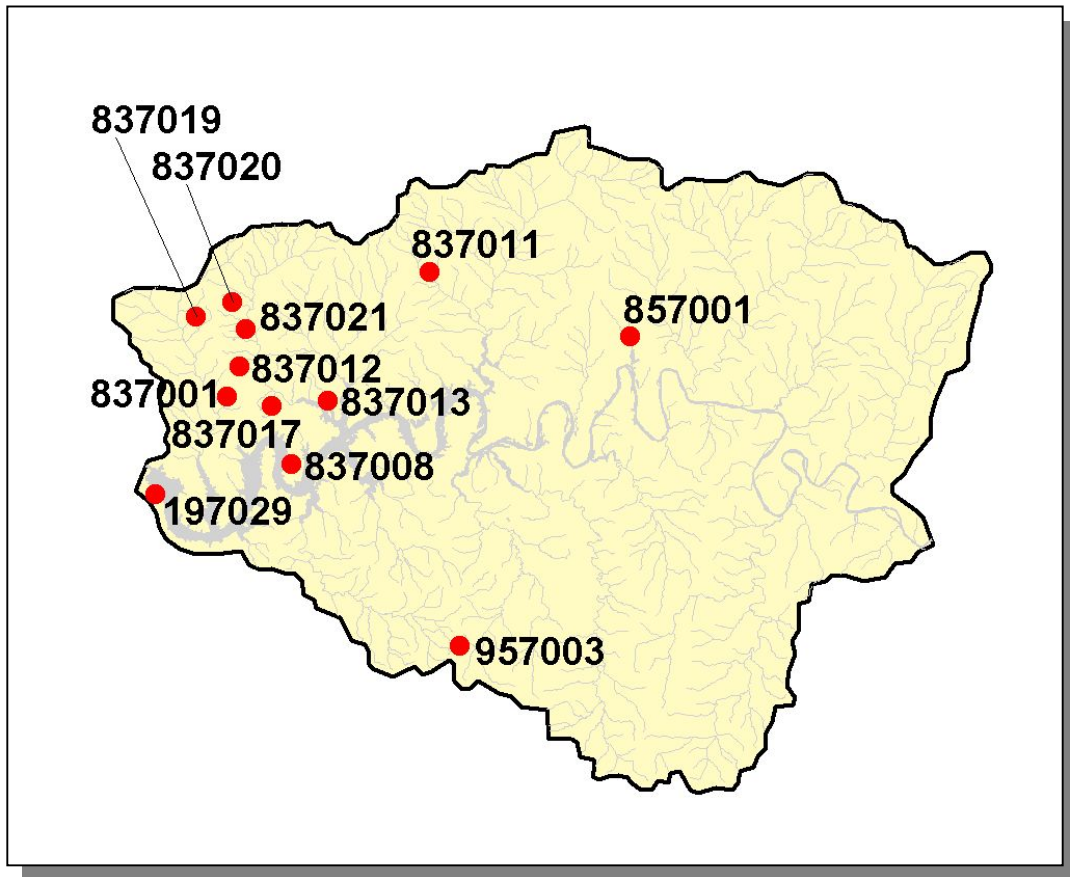
*Figure 2-3. The Old Hickory Lake Watershed is Part of the Cumberland River Basin.*



**Figure 2-4. Hydrology in the Old Hickory Lake Watershed.** There are 1,164.3 stream miles and 27,439 lake acres recorded in River Reach File 3 in the Old Hickory Lake Watershed. Location of the Cumberland River including Old Hickory Lake, and the cities of Carthage, Hartsville, Hendersonville, and Watertown are shown for reference.

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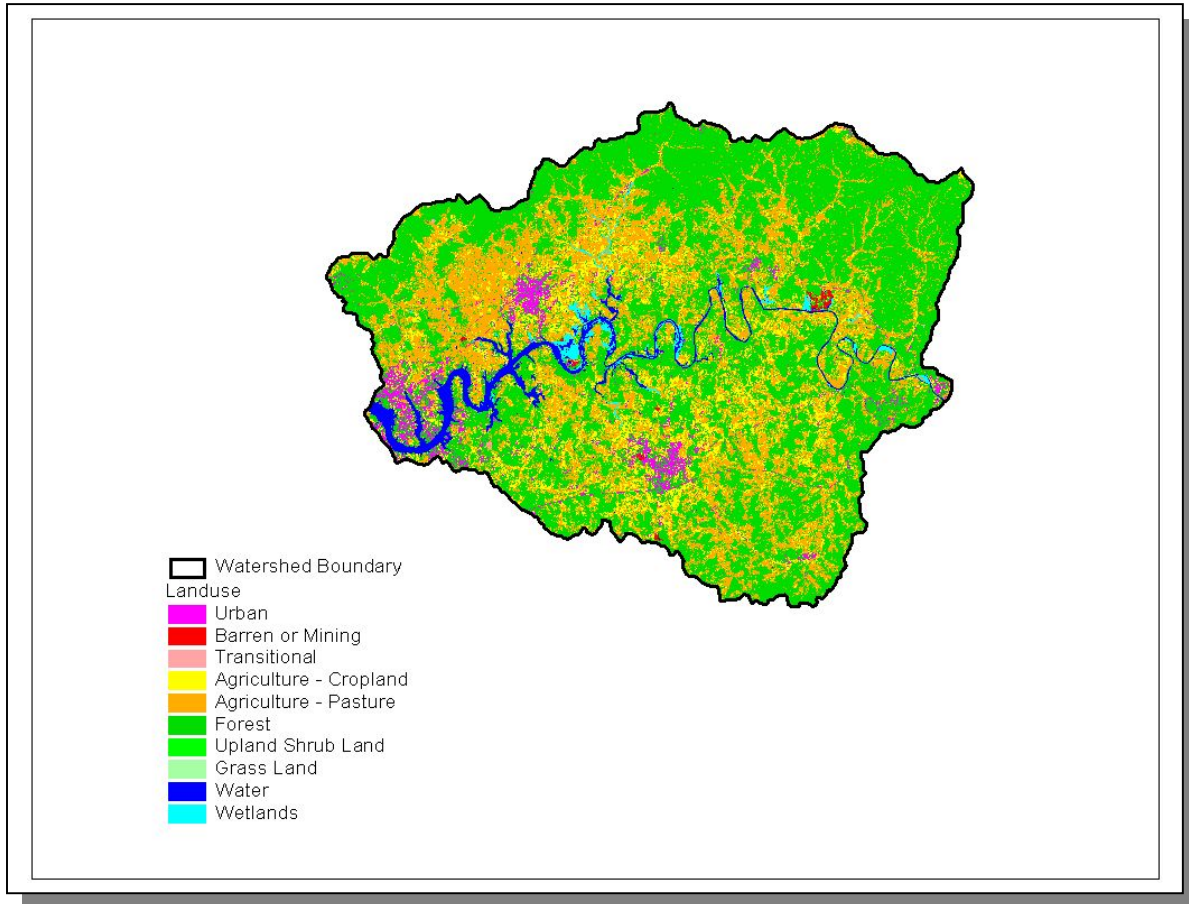
**2.3.B. Dams.** There are 12 dams inventoried by TDEC Division of Water Supply in the Old Hickory Lake Watershed. These dams either retain 30 acre-feet of water or have structures at least 20 feet high.



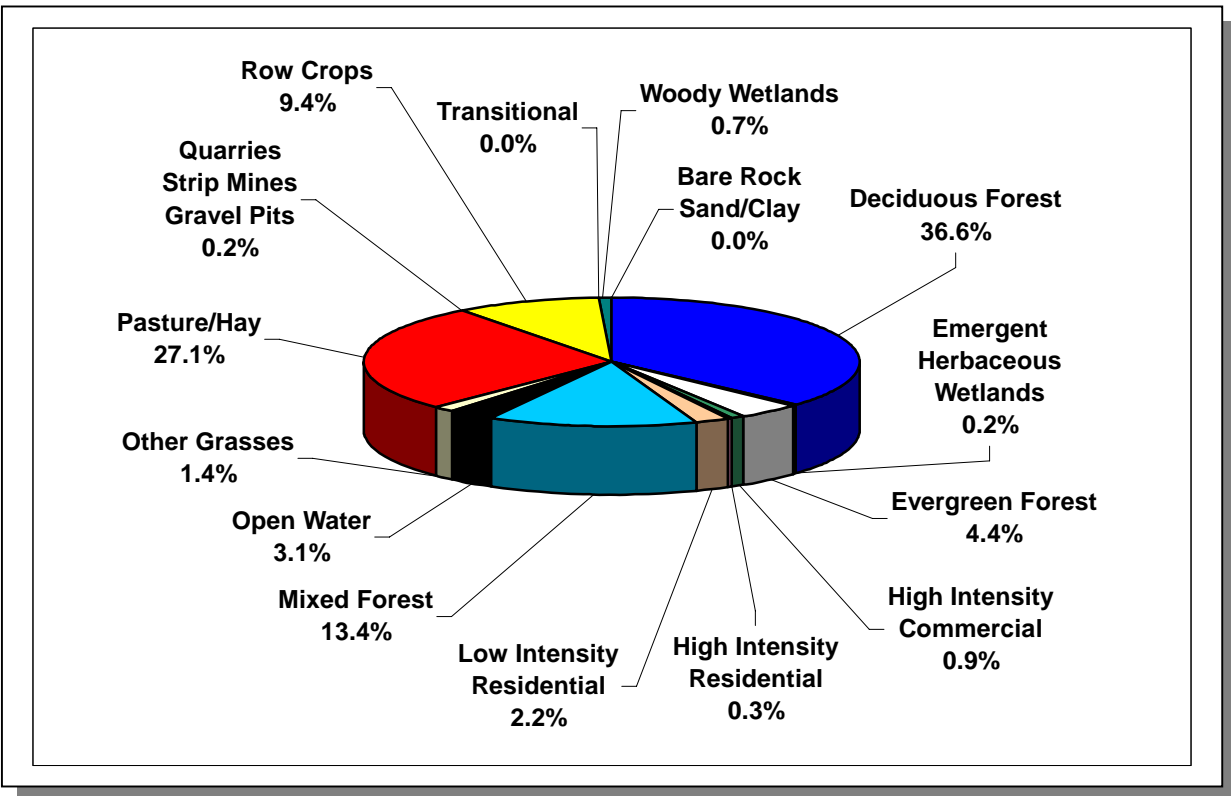
**Figure 2-5. Location of Inventoried Dams in the Old Hickory Lake Watershed.** More information is provided in Appendix II and at <http://gwidc.memphis.edu/website/dws/>.

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**2.4. LAND USE.** Land Use/Land Cover information was provided by EPA Region 4 and was interpreted from 1992 Multi-Resolution Land Cover (MRLC) satellite imagery.

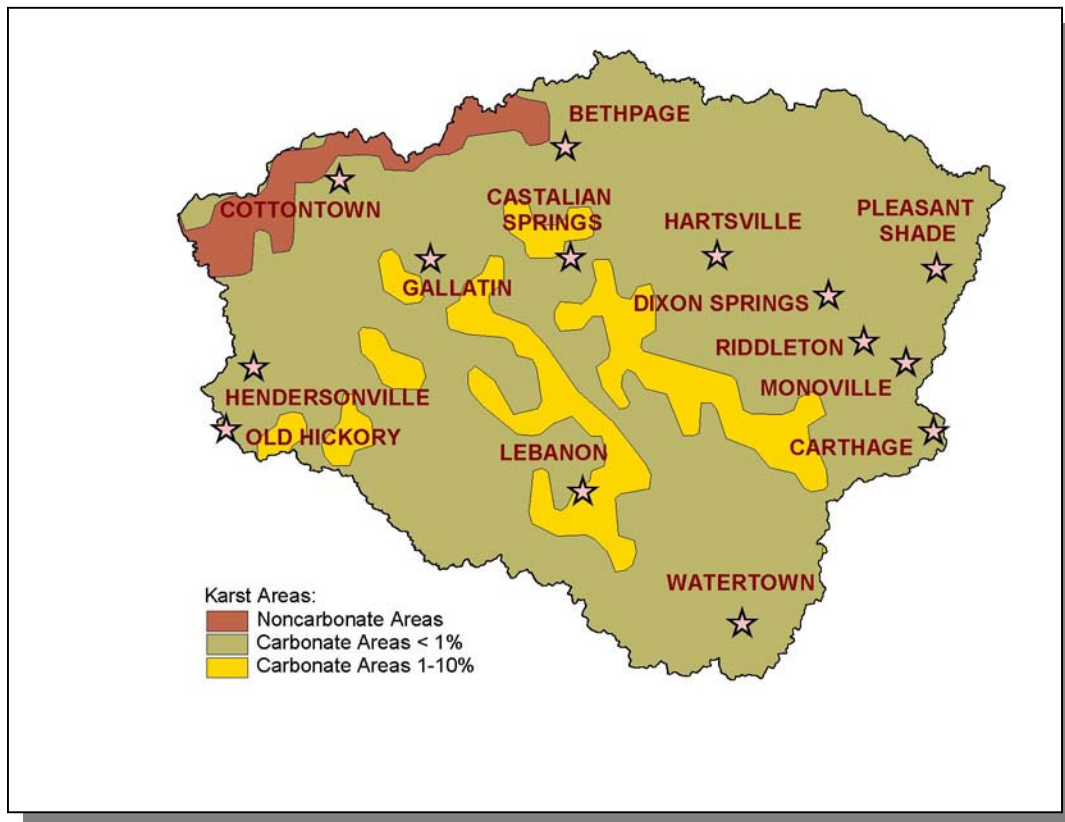


**Figure 2-6. Illustration of Select Land Cover/Land Use Data from MRLC Satellite Imagery.**

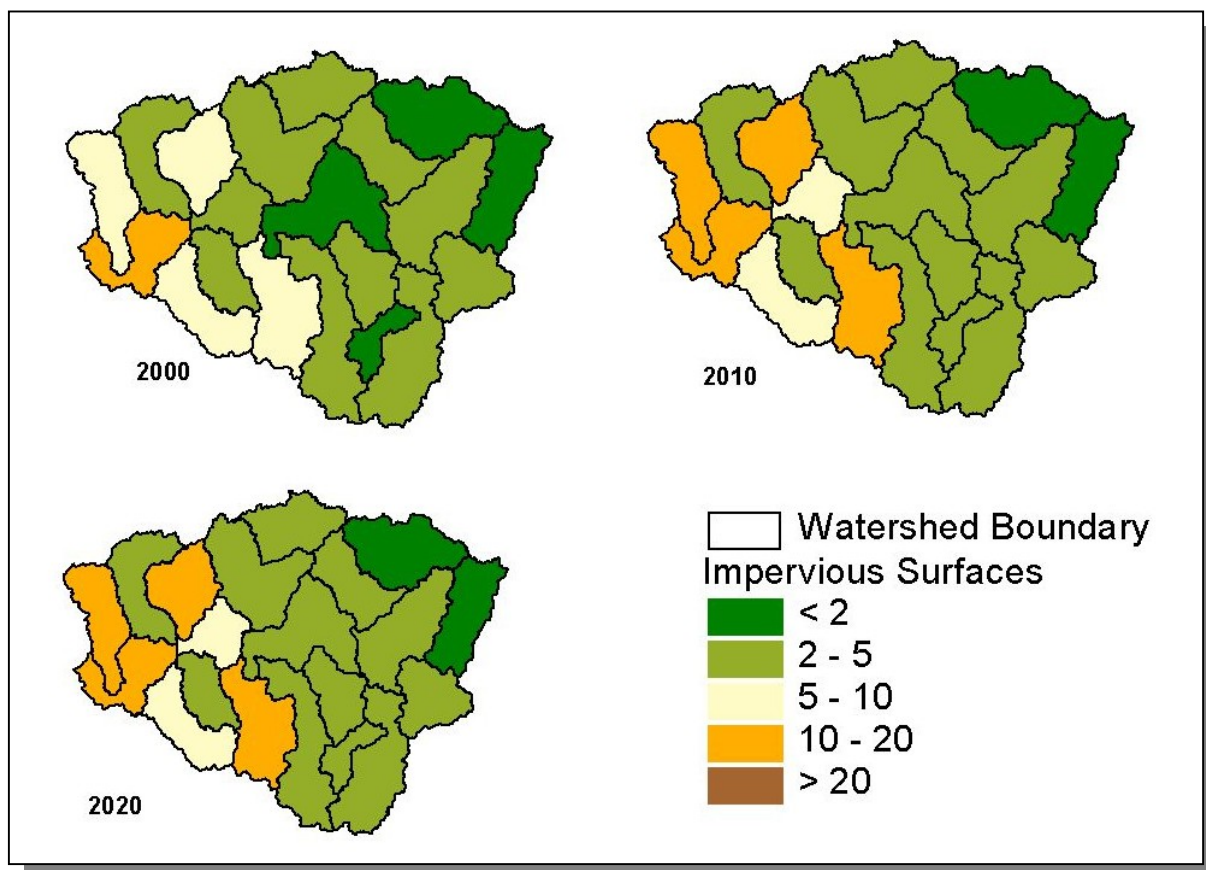


**Figure 2-7. Land Use Distribution in the Old Hickory Lake Watershed.** More information is provided in Appendix II.

Sinkholes, springs, disappearing streams and caves characterize karst topography. The term “karst” describes a distinctive landform that indicates dissolution of underlying soluble rocks by surface water or ground water. Although commonly associated with limestone and dolomite (carbonate rocks), other highly soluble rocks such as gypsum and rock salt can be sculpted into karst terrain. In karst areas, the ground water flows through solution-enlarged channels, bedding planes and microfractures within the rock. The characteristic landforms of karst regions are: closed depressions of various size and arrangement; disrupted surface drainage; and caves and underground drainage systems. The term “karst” is named after a famous region in the former country of Yugoslavia.



**Figure 2-8. Illustration of Karst Areas in the Old Hickory Lake Watershed.** Locations of communities in the watershed are shown for reference.



**Figure 2-9. Illustration of Total Impervious Area in the Old Hickory Lake Watershed.** All HUC-12 subwatersheds are shown. Current and projected total impervious cover is provided by EPA Region 4. More information can be found at: <http://www.epa.gov/ATHENS/research/impervious/>

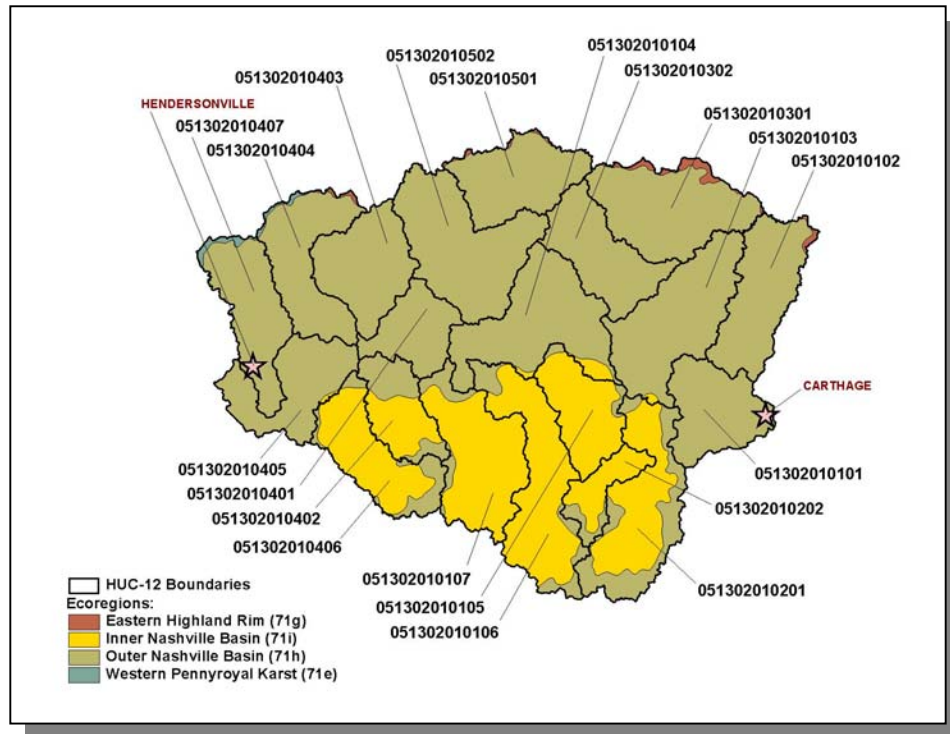
**2.5. ECOREGIONS AND REFERENCE STREAMS.** Ecoregions are relatively homogeneous areas of similar geography, topography, climate and soils that support similar plant and animal life. Ecoregions serve as a spatial framework for the assessment, management, and monitoring of ecosystems and ecosystem components. Ecoregion studies can aid the selection of regional stream reference sites, identifying high quality waters, and developing ecoregion-specific chemical and biological water quality criteria.

There are eight Level III Ecoregions and twenty-five Level IV subecoregions in Tennessee. The Old Hickory Lake Watershed lies within 1 Level III ecoregion (Interior Plateau) and contains 4 Level IV subecoregions:

- The **Western Pennyroyal Karst (71e)** is a flatter area of irregular plains, with fewer perennial streams, compared to the open hills of the Western Highland Rim (71f). Small sinkholes and depressions are common. The productive soils of this notable agricultural area are formed mostly from a thin loess mantle over residuum of Mississippian-age limestones. Most of the region is cultivated or in pasture; tobacco and livestock are the principal agricultural products, with some corn, soybeans, and small grains. The natural vegetation consisted of oak-hickory forest with mosaics of bluestem prairie. The barrens of Kentucky that extended south into Stewart, Montgomery, and Robertson counties, were once some of the largest natural grasslands in Tennessee.
- The **Eastern Highland Rim (71g)** has level terrain, with landforms characterized as tablelands of moderate relief and irregular plains. Mississippian-age limestone, chert, shale, and dolomite predominate, and karst terrain sinkholes and depressions are especially noticeable between Sparta and McMinnville. Numerous springs and spring-associated fish fauna also typify the region. Natural vegetation for the region is transitional between the oak-hickory type to the west and the mixed mesophytic forests of the Appalachian ecoregions (68, 69) to the east. Bottomland hardwood forest has been inundated by several large impoundments. Barrens and former prairie areas are now mostly oak thickets or pasture and cropland.
- **Outer Nashville Basin (71h)** is a more heterogeneous region than the Inner Nashville Basin, with more rolling and hilly topography and slightly higher elevations. The region encompasses most all of the outer areas of the generally non-cherty Ordovician limestone bedrock. The higher hills and knobs are capped by the more cherty Mississippian-age formations, and some Devonian-age Chattanooga shale, remnants of the Highland Rim. The region's limestone rocks and soils are high in phosphorus, and commercial phosphate is mined. Deciduous forests with pasture and cropland are the dominant land covers. Streams are low to moderate gradient, with productive nutrient-rich waters, resulting in algae, rooted vegetation, and occasionally high densities of fish. The Nashville Basin as a whole has a distinctive fish fauna, notable for fish that avoid the region, as well as those that are present.
- The **Inner Nashville Basin (71i)** is less hilly and lower than the Outer Nashville Basin (71h), outcrops of the Ordovician-age limestone are common,

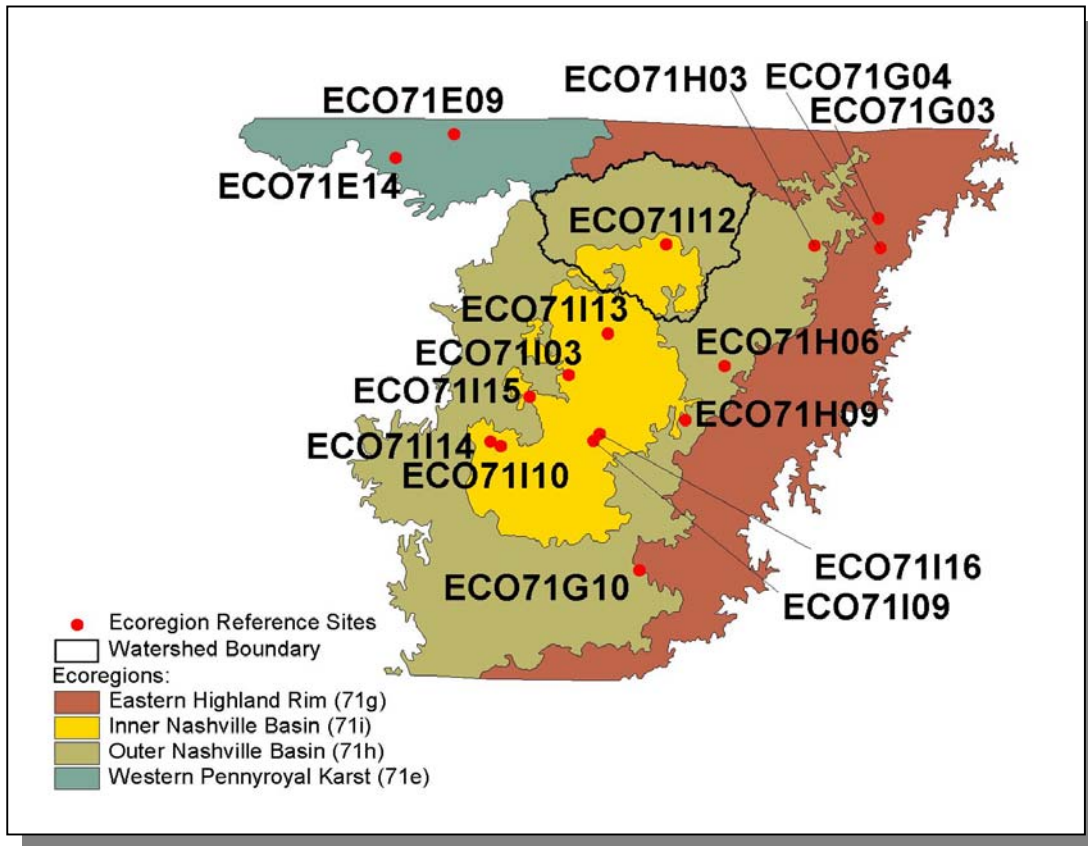
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and the generally shallow soils are redder and lower in phosphorus than those of the outer basin. Streams are lower gradient than surrounding regions, often flowing over large expanses of limestone bedrock. The most characteristic hardwoods within the inner basin are a maple-oak-hickory-ash association. The limestone cedar glades of Tennessee, a unique mixed grassland / forest cedar glades vegetation type with many endemic species, are located primarily on the limestones of the Inner Nashville Basin. The more xeric, open characteristics and shallow soils of the cedar glades also result in a distinct distribution of amphibian and reptile species. Urban suburban, and industrial land use in the region is increasing.



**Figure 2-10. Level IV Ecoregions in the Old Hickory Lake Watershed.** Locations of Carthage and Hendersonville are shown for reference.

Each Level IV Ecoregion has at least one reference stream associated with it. A reference stream represents a least impacted condition and may not be representative of a pristine condition.



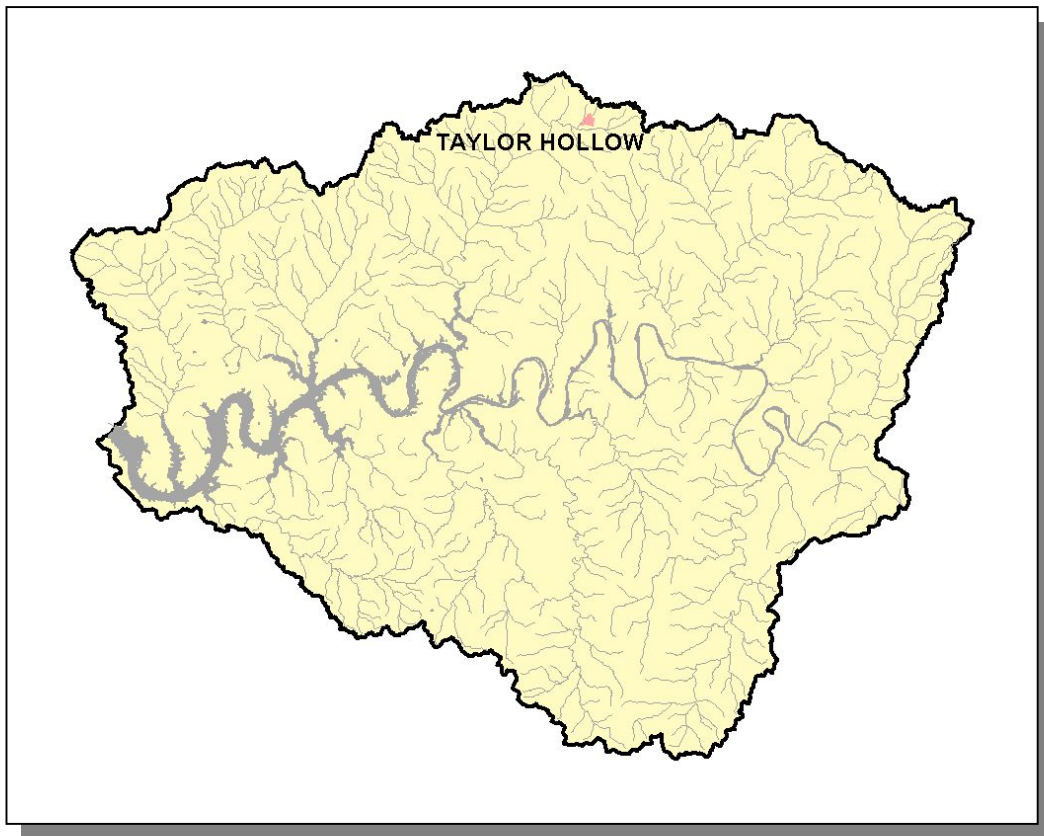
**Figure 2-11. Ecoregion Monitoring Sites in Level IV Ecoregions 71e, 71g, 71h, and 71i.** The Old Hickory Lake Watershed is shown for reference. More information, including which ecoregion reference sites were inactive or dropped prior to 01/01/2006, is provided in Appendix II.

## **2.6. NATURAL RESOURCES.**

**2.6.A. Designated State Natural Area.** The Natural Areas Program was established in 1971 with the passage of the Natural Areas Preservation Act. TDEC/Division of Natural Heritage administers the State Natural Areas program. Further information may be found at <http://www.state.tn.us/environment/nh/natareas/>

The Old Hickory Lake Watershed has one Designated State Natural Area:

**Taylor Hollow Class II Natural-Scientific State Natural Area** is a 173-acre natural area located in Sumner County on the Western Highland Rim and is owned by The Nature Conservancy. It is a botanically rich and a biologically diverse area and is one of only a very few areas remaining like this in Middle Tennessee that has been minimally impacted by human activity.



*Figure 2-12. There is One Designated State Natural Area in the Old Hickory Lake Watershed.*

**2.6.B. Rare Plants and Animals.** The Heritage Program in the TDEC Division of Natural Heritage maintains a database of rare species that is shared by partners at The Nature Conservancy, Tennessee Wildlife Resources Agency, the US Fish and Wildlife Service, and the Tennessee Valley Authority. The information is used to: 1) track the occurrence of rare species in order to accomplish the goals of site conservation planning and protection of biological diversity, 2) identify the need for, and status of, recovery plans, and 3) conduct environmental reviews in compliance with the federal Endangered Species Act.

GROUPING	NUMBER OF RARE SPECIES
Insects	1
Mussels	9
Amphibians	1
Birds	4
Fish	6
Mammals	4
Reptiles	3
Plants	25
<b>Total</b>	<b>53</b>

***Table 2-3. There are 53 Known Rare Plant and Animal Species in the Old Hickory Lake Watershed.***

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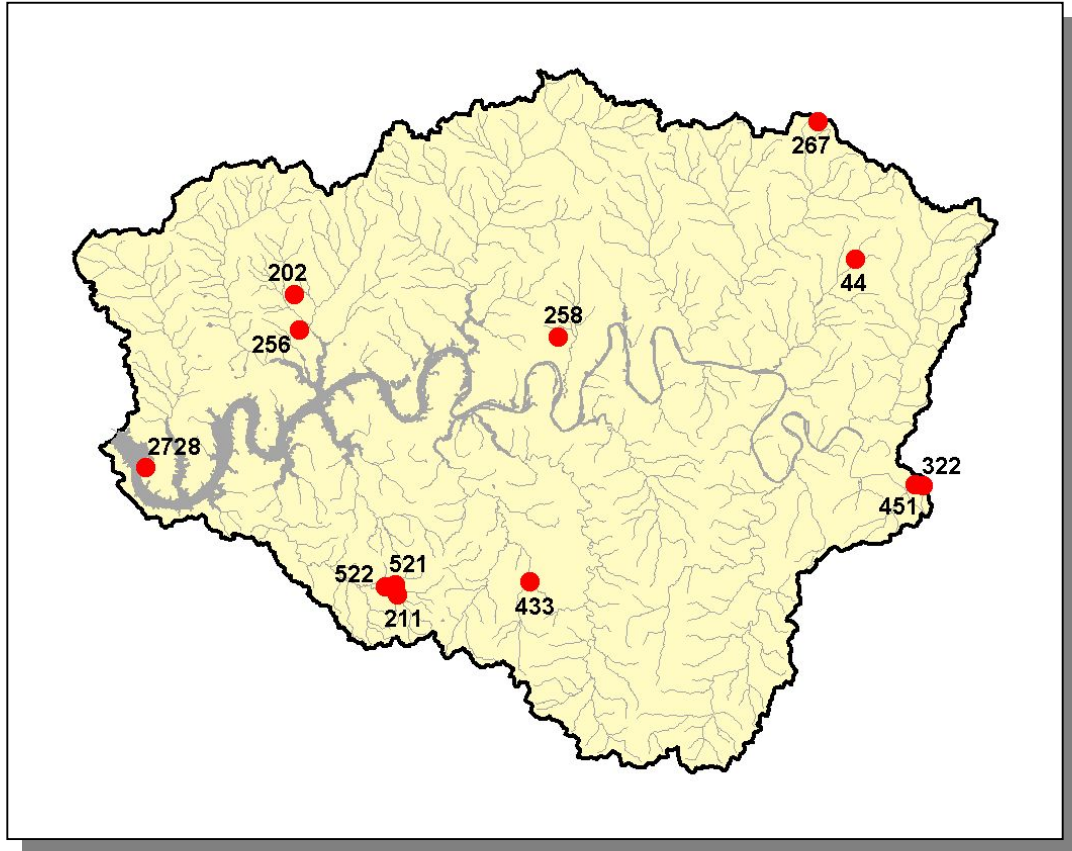
In the Old Hickory lake Watershed, there are six known rare fish species and nine known rare mussel species.

SCIENTIFIC NAME	COMMON NAME	FEDERAL STATUS	STATE STATUS
<i>Etheostoma olivaceum</i>	Sooty darter		D
<i>Hemitremia flammea</i>	Flame chub		D
<i>Moxostoma atripinne</i>	Blackfin sucker		D
<i>Notropis rupestris</i>	Bedrock shiner		D
<i>Percina phoxocephala</i>	Slenderhead darter		D
<i>Typhlichthys subterraneus</i>	Southern cavefish		D
<i>Dromus dromas</i>	Dromedary pearlymussel	LE	E
<i>Epioblasma brevidens</i>	Cumberlandian combshell	LE	E
<i>Epioblasma obliquata obliquata</i>	Catspaw pearlymussel	LE	E
<i>Lampsilis abrupta</i>	Pink mucket	LE	E
<i>Obovaria retusa</i>	Ring pink	LE	E
<i>Plethobasus cicatricosus</i>	White wartyback	LE	E
<i>Plethobasus cooperianus</i>	Orange-foot pimpleback	LE	E
<i>Pleurobema plenum</i>	Rough pigtoe	LE	E
<i>Quadrula sparsa</i>	Appalachian monkeyface	LE	E
<i>Leptoxis subglobosa umbilicata</i>	Umbilicate rocksnail		
<i>Lithasia geniculata fuliginosa</i>	Geniculate riversnail		
<i>Lithasia geniculata pinguis</i>	Small geniculate riversnail		

**Table 2-4. Rare Aquatic Species in the Old Hickory Lake Watershed.** Federal Status: LE, Listed Endangered by the U.S. Fish and Wildlife Service. State Status: E, Listed Endangered by the Tennessee Wildlife Resources Agency; D, Deemed in Need of Management by the Tennessee Wildlife Resources Agency. More information may be found at <http://www.state.tn.us/environment/na/>.

**2.6.C. Wetlands.** The Division of Natural Heritage maintains a database of wetland records in Tennessee. These records are a compilation of field data from wetland sites inventoried by various state and federal agencies. Maintaining this database is part of Tennessee's Wetland Strategy, which is described at:

<http://www.state.tn.us/environment/nh/wetlands/>



**Figure 2-13. Location of Wetland Sites in TDEC Division of Natural Heritage Database in Old Hickory Lake Watershed.** This map represents an incomplete inventory and should not be considered a dependable indicator of the presence of wetlands. There may be additional wetland sites in the watershed. More information is provided in Appendix II.

## **2.7. CULTURAL RESOURCES.**

**2.7.A. Nationwide Rivers Inventory.** The Nationwide Rivers Inventory, required under the Federal Wild and Scenic Rivers Act of 1968, is a listing of free-flowing rivers that are believed to possess one or more outstanding natural or cultural values. Exceptional scenery, fishing or boating, unusual geologic formations, rare plant and animal life, cultural or historic artifacts that are judged to be of more than local or regional significance are the values that qualify a river segment for listing. The Tennessee Department of Environment and Conservation and the Rivers and Trails Conservation Assistance branch of the National Park Service jointly compile the Nationwide Rivers Inventory from time to time (most recently in 1997). Under a 1980 directive from the President's Council on Environmental Quality, all Federal agencies must seek to avoid or mitigate actions that would have an adverse effect on Nationwide Rivers Inventory segments.

The most recent version of the Nationwide Rivers Inventory lists portions of two streams in the Old Hickory Lake Watershed:

Bledsoe Creek (RM 0 to RM 14) is an historic, very scenic float stream.

Goose Creek (RM 0 to RM 15) is a small, scenic mountain stream that supports a game fishery.

RIVER	SCENIC	RECREATION	GEOLOGIC	FISH	WILDLIFE	HISTORIC	CULTURAL
Bledsoe Creek	X	X	X	X	X	X	X
Goose Creek	X	X		X	X		

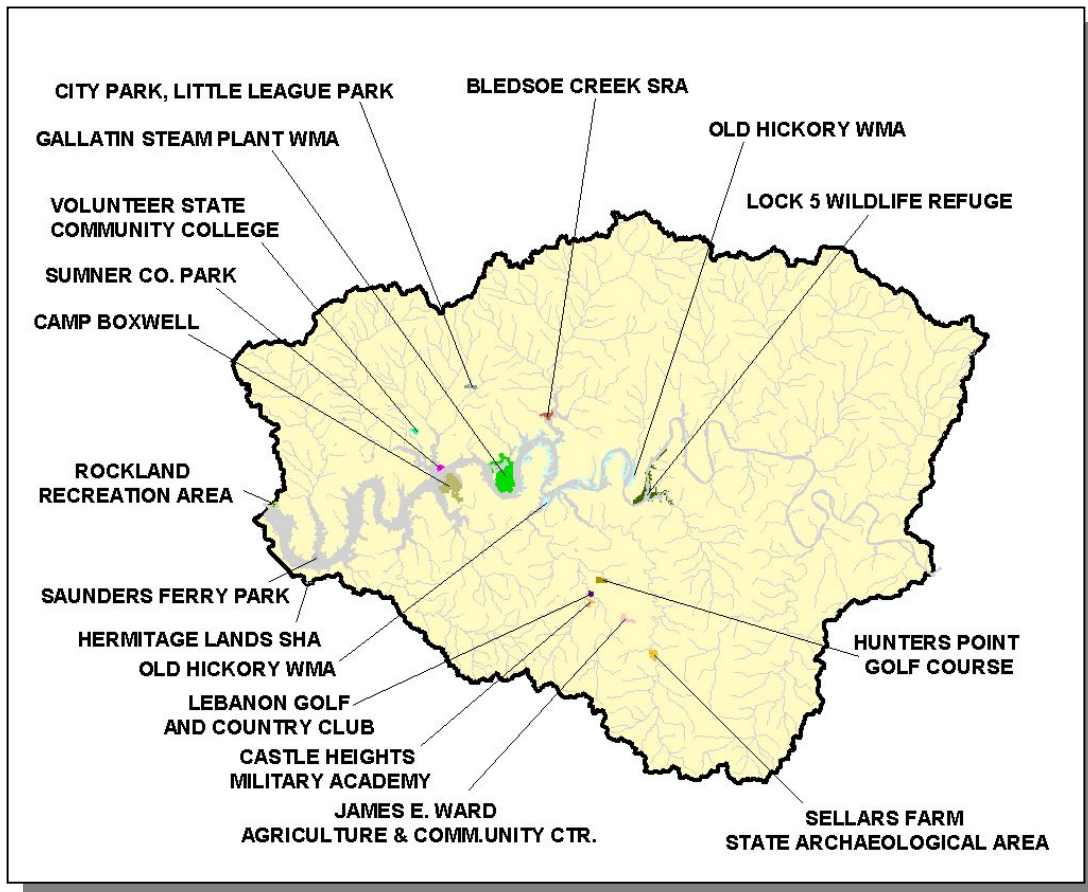
***Table 2-5. Attributes of Streams Listed in the Nationwide Rivers Inventory.***

Additional information may be found online at <http://www.ncrc.nps.gov/rtca/nri/>

**2.7.B. Public Lands.** Some sites representative of the cultural heritage are under state or federal protection:

- Bledsoe Creek State Recreation Area is a 164-acre state park located on an embayment of Old Hickory Lake. More information may be found at <http://www.state.tn.us/environment/parks/parks/BledsoeCreek/>.
- Camp Boxwell is a 1273-acre Boy Scout Reservation located on Old Hickory Lake. More information may be found at <http://www.mtcbsa.org/html/boxwell.htm>.
- Castle Heights Military Academy, also known as Castle Heights Academy Historic District, is located in Lebanon.
- Gallatin Steam Plant Wildlife Management Area is a 1,500-acre area managed by TWRA in Sumner County.
- Hunters Point Golf Course is located in Lebanon. More information may be found at [http://www.tnvacation.com/vendors/hunters\\_point\\_golf\\_course/](http://www.tnvacation.com/vendors/hunters_point_golf_course/).
- James E. Ward Agricultural and Community Center is located in Lebanon. More information may be found at: [http://www.tnvacation.com/vendors/james\\_e\\_ward\\_agricultural\\_center/](http://www.tnvacation.com/vendors/james_e_ward_agricultural_center/).
- Hermitage Lands State Historic Area, located mainly in the Stones River Watershed, is the home of President Andrew Jackson. More information may be found at <http://www.thehermitage.com/>.
- Lock 5 Wildlife Refuge is a 900-acre area managed by TWRA in Trousdale and Wilson Counties.
- Old Hickory Wildlife Management Area is a 6,000-acre area managed by TWRA in Sumner, Trousdale, and Wilson Counties.
- Rockland Recreation Area is located on Old Hickory Lake and operated by the U.S. Army Corps of Engineers. More information may be found at <http://nashville.citysearch.com/profile/11340248/>.
- Saunders Ferry Park is located on an embayment of Old Hickory Lake in Hendersonville.
- Sellars Farm State Historic Area is a study site for a Native American mound village located in the southeastern portion of Lebanon. More information may be found at [http://webwhisper.com/Sellars\\_Farm\\_SAA/fsfindex.html](http://webwhisper.com/Sellars_Farm_SAA/fsfindex.html).
- Sumner County Park is located in Laguardo.

- Volunteer State Community College is a two-year community college located in Gallatin. More information may be found at <http://www.vsccl.cc.tn.us/>.



**Figure 2-14. Public Lands in the Old Hickory Lake Watershed.** Data are from Tennessee Wildlife Resources Agency. SRA, State Recreation Area; WMA, Wildlife Management Area.

**2.8. TENNESSEE RIVERS ASSESSMENT PROJECT.** The Tennessee Rivers Assessment is part of a national program operating under the guidance of the National Park Service's Rivers and Trails Conservation Assistance Program. The Assessment is an inventory of river resources, and should not be confused with "Assessment" as defined by the Environmental Protection Agency. A more complete description can be found in the Tennessee Rivers Assessment Summary Report, which is available from the Department of Environment and Conservation and on the web at:

<http://www.state.tn.us/environment/wpc/publications/riv/>

STREAM	NSQ	RB	RF	STREAM	NSQ	RB	RF
Bartons Creek	3	3		Hawkins Branch	3		
Big Goose Creek	2	2	1	Jennings Fork Creek	3		
Bledsoe Creek	3	2	1	Liberty Creek	3		
Cedar Creek (eastern)	2	2	1	Little Goose Creek	3		
Cedar Creek (Western)	3	2		Middle Fork Goose Creek	3		
Cumberland River	2			Peyton Creek	3		
Deshea Creek	3			Rocky Creek	3		
Dixon Creek	3			Round Lick Creek	2		
Drakes Creek	2	3		Spencer Creek	3		
Dry Fork Creek	2			Spring Creek	2	2	1
East Camp Creek	3			Station camp Creek	3	2	1
East Fork Bledsoe Creek	2			Town Creek	4		

**Table 2-6. Stream Scoring from the Tennessee Rivers Assessment Project.**

Categories: NSQ, Natural and Scenic Qualities  
RB, Recreational Boating  
RF, Recreational Fishing

Scores: 1. Statewide or greater Significance; Excellent Fishery  
2. Regional Significance; Good Fishery  
3. Local Significance; Fair Fishery  
4. Not a significant Resource; Not Assessed